

# MISR Level 2 Top-of- Atmosphere/Cloud Products Quality Statement

February 16, 2001

## Quality Designator: Beta

[MISR maturity level definitions](#)

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This statement applies to MISR Level 2 TC Stereo for February 16, 2001, and beyond until such a time as further improvements to MISR software are made.

An extensive review of product quality has not yet been performed. Please read the [summary words of caution](#) if you did not do so earlier.

Many of the algorithms used in the stereo product retrievals have been developed specifically for the MISR instrument, and as such, are relatively untested. We expect to improve on these algorithms as we gain experience with the data. Trade-offs have been made at times to sacrifice accuracy or coverage for speed and vice versa.

In spite of all the warnings, the MISR Level 2 TC Stereo software which generated these products is believed to be functioning nominally except where noted below. This statement highlights major known problems with the products, as well as functionalities which are currently not implemented.

Note that the Classifiers and Albedo products, which contain cloud classification and TOA albedo respectively, have not been implemented. They are unavailable at this time.

## L2TC Stereo (a.k.a. TC\_STEREO) (from MISR PGE8a)

### REGISTRATION

Cloud motion calculations are quite sensitive to the quality of registration of the D camera L1B2 ellipsoid-projected radiance products. Since Level 1 does not yet utilize Reference Orbit Imagery (ROI) when performing registration correction, the registration relies on a fairly static camera model. The camera model changes periodically, and although the registration is typically much better, the camera models in use only guarantee accuracy of 2 pixels or less in the D cameras. Cloud height accuracy is nominally 562 m, corresponding to 1 pixel of accuracy in the A cameras. Under the best of conditions, the heights often appear quantized. Further, they are occasionally made worse due to errors in cloud motion caused by misregistration of the D cameras. A 2 pixel D camera error translates to a 10-15 m/s error in the cloud motion vectors, which propagates to an error of 1100 m in height. We expect the registration reliability to improve significantly when the ROI is used, and we anticipate a reduction in height and wind uncertainties of approximately a factor of 2. For more details, including a link to a list of orbits with known registration problems, see the [Registration Page](#).

### DOMAIN ARTIFACTS

Cloud motion retrievals are made on 70.4 km domains. This may at times result in discontinuities at domain boundaries for cloud heights.

### STRIPES

Horizontal stripes may occasionally appear in the product for some parameters. This is due to one or more missing lines of data in Level 1, and often shows up in Level 2 parameters as "No Retrieval" flag values. For more details, read sections on [Gaps](#) and [Instrument Out-of-Sync](#) in the Level 1 Statement.

### BLUNDERS

Blunder detection has not been implemented. As a result, spikes may occasionally appear in the cloud heights. In addition, a known bug exists in the code which occasionally causes entire 70.4 km domains to contain a very high number of blunders. We expect this bug to be fixed in the next patch delivery.

### ALGORITHM UPDATES

The cloud motion and height retrievals have changed somewhat from the Level 2 Cloud Detection and Classification ATB (JPL D-11399, Rev. D). These changes will be reflected in the next release of the document, Rev E. Highlights include:

- The histogramming of the cloud motion for each domain now involves the identification of clusters of points which may cross the histogram bin boundaries, resulting in a matrix which identifies the clusters. The clusters chosen for the two cloud layers must be local maxima in this matrix. The histogram now includes a center bin which is centered on 0.0 in each direction. We no longer concatenate bins with the same population together but rather choose the one with the smallest height range.
- External meteorological inputs such as MODIS and NSIDC are not yet used. Instead, a static monthly climatology (the TASC dataset) is used.



- PGE 8b, which includes cloud classifiers, the cloud shadow mask and topographic shadow mask, has not yet been developed.
- PGE 8c, which includes local, restrictive, and expansive albedo, has been developed, but the product is not yet ready for public release.

Until we gain further validation of the Level 1 Radiometric Camera-by-camera Cloud Mask (RCCM), its usage has been turned off by Stereo processing. Therefore, the Stereoscopically Derived Cloud Mask relies solely on stereoscopically matched data to determine the presence of clouds.

